

# Bioterrorism

	Means of spread	Isolation	Human to human transmission	Incubation period	Duration	Symptoms	Diagnosis and Treatment	Lethality	Vaccine avail?
<b>Anthrax (Inhalation)</b> ( <i>Bacillus anthracis</i> ) CDC Category A	Spores in aerosol	Standard	No	1-7 days (may be as long as 43 days)	3-5 days	<ul style="list-style-type: none"> <li>• Fever and chills</li> <li>• Chest Discomfort</li> <li>• Shortness of breath</li> <li>• Confusion or dizziness</li> <li>• Cough</li> <li>• Nausea, vomiting, or stomach pains</li> <li>• Headache</li> <li>• Sweats (often drenching)</li> <li>• Extreme tiredness</li> <li>• Body aches</li> </ul>	<ul style="list-style-type: none"> <li>• CXR or CT to ID mediastinal widening or pleural effusion</li> <li>• measure antibodies or toxin in blood</li> <li>• test directly for <i>Bacillus anthracis</i> in a sample</li> <li>• blood</li> <li>• skin lesion swab</li> <li>• spinal fluid</li> <li>• respiratory secretions</li> </ul> <p><i>Samples must be taken before the patient begins taking antibiotics for treatment</i></p> <ul style="list-style-type: none"> <li>• Ciprofloxacin</li> <li>• Doxycycline and/or PCN</li> </ul>	High	yes
<b>Smallpox</b> (Variola major) CDC Category A	Aerosol	Extreme biohazard	High	7-17 days	4 weeks	<p>Highly contagious- become contagious when first sores appear in mouth and throat; remain contagious until last pox scab falls off.</p> <p><b>Prodrome:</b></p> <ul style="list-style-type: none"> <li>• fever,</li> <li>• malaise,</li> <li>• head and body aches,</li> <li>• vomiting</li> </ul> <p><b>Early Rash:</b> (most contagious)</p> <ul style="list-style-type: none"> <li>• red spots that start in mouth, then face, then spread to arms, legs, then hands and feet</li> </ul> <p><b>Late rash:</b></p> <ul style="list-style-type: none"> <li>• Spots become bumps, then pustules, eventually crusting over</li> </ul>	<ul style="list-style-type: none"> <li>• Polymerase chain reaction (PCR) ID of variola DNA in a clinical specimen, <b>OR</b></li> <li>• Isolation of variola virus from a clinical specimen <b>with</b> variola PCR confirmation.</li> </ul> <p><b>Treatment</b></p> <p>Cidofovir, Brincidofovir,</p>	High to mod	Yes
<b>Ebola</b> (filovirus) CDC Category A	Aerosol or direct contact	Extreme biohazard	Moderate with direct contact	4-16 days	Death between 7-16 days	<ul style="list-style-type: none"> <li>• Fever</li> <li>• Severe headache</li> <li>• Muscle pain</li> <li>• Weakness</li> <li>• Fatigue</li> <li>• Diarrhea</li> <li>• Vomiting</li> <li>• Abdominal (stomach) pain</li> <li>• Unexplained hemorrhage (bleeding or bruising)</li> <li>• death usually from hemorrhagic shock and multi-organ failure</li> </ul>	<p><b>Diagnosis:</b></p> <ul style="list-style-type: none"> <li>• Antigen-capture enzyme-linked immunosorbent assay (ELISA) testing</li> <li>• IgM ELISA</li> <li>• Polymerase chain reaction (PCR)</li> <li>• Virus isolation</li> </ul> <p><b>Treatment:</b></p> <ul style="list-style-type: none"> <li>• Supportive care</li> <li>• Fluid replacement</li> </ul>	High 50-90% mortality rate;	No

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<b>Plague</b> <i>(Yersinia pestis)</i> CDC Category A	Aerosol	Droplet – prefer N95 mask	Moderate	1-7 days (usually 2-3 days)	1-6 days	<b>Bubonic plague:</b> <ul style="list-style-type: none"> <li>• sudden onset of fever,</li> <li>• headache,</li> <li>• chills,</li> <li>• weakness and</li> <li>• one or more swollen, tender and painful lymph nodes (called buboes).</li> </ul> <b>Septicemic plague:</b> <ul style="list-style-type: none"> <li>• fever,</li> <li>• chills,</li> <li>• extreme weakness,</li> <li>• abdominal pain,</li> <li>• shock, and</li> <li>• possibly bleeding into the skin and other organs. Skin and other tissues may turn black and die, especially on fingers, toes, and the nose.</li> </ul> <b>Pneumonic plague:</b> <ul style="list-style-type: none"> <li>• fever,</li> <li>• headache,</li> <li>• weakness,</li> <li>• rapidly developing pneumonia with shortness of breath, chest pain, cough, and sometimes bloody or watery mucous</li> <li>• respiratory failure and shock.</li> <li>• May develop acral gangrene</li> </ul>	<ul style="list-style-type: none"> <li>• Streptomycin/ gentamicin</li> <li>• Doxycycline or ciprofloxacin</li> <li>• Chloramphenicol for plague meningitis</li> </ul>	High	no
<b>Tularemia</b> <i>(Francisella tularensis)</i> CDC Category A	Aerosol	Standard	No	1-21 days (usually 2-3 days)	>2 weeks without tx	<ul style="list-style-type: none"> <li>• sudden fever/ chills</li> <li>• headaches</li> <li>• diarrhea</li> <li>• muscle aches</li> <li>• joint pain</li> <li>• dry cough</li> <li>• progressive weakness</li> <li>• pneumonia (chest pain, bloody sputum and respiratory distress or arrest)</li> </ul>	<ul style="list-style-type: none"> <li>• Streptomycin/ gentamicin</li> <li>• Post-exposure: doxycycline or ciprofloxacin</li> </ul>	Mod if not treated	No

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<b>Cholera</b> ( <i>Vibrio cholera</i> ) CDC Category B	Food/ water Aerosol	Contact	Rare	12 hrs – 6 days	>7 days	<ul style="list-style-type: none"> <li>• profuse watery diarrhea - “rice-water stools,”</li> <li>• vomiting</li> <li>• rapid heart rate</li> <li>• loss of skin elasticity</li> <li>• dry mucous membranes</li> <li>• low blood pressure</li> <li>• thirst</li> <li>• muscle cramps</li> <li>• restlessness or irritability</li> </ul>	<ul style="list-style-type: none"> <li>• Tetracycline/ doxycycline</li> <li>• Rehydration</li> <li>• Electrolyte replacement</li> </ul>	Low with tx, high without	Yes
<b>Botulism</b> ( <i>Clostridium botulinum</i> toxin) CDC Category A	Food supplies Aerosol	Standard	No	6 hours to 10 days (most commonly between 12 and 36 hours)	Death in 48-72 hours – if non-lethal may last months	4 Ds: diplopia, dysarthria; dysphonia; dysphagia <ul style="list-style-type: none"> <li>• blurred vision,</li> <li>• drooping eyelids,</li> <li>• slurred speech,</li> <li>• difficulty swallowing,</li> <li>• dry mouth,</li> <li>• muscle weakness (moves down body)</li> <li>• Paralysis of breathing muscles</li> </ul>	<ul style="list-style-type: none"> <li>• Supportive care</li> <li>• Ventilatory support</li> <li>• Equine antitoxin</li> <li>• Avoid clindamycin and aminoglycosides</li> </ul>	High without resp support	Not yet
<b>Q Fever</b> ( <i>Coxiella burnetii</i> ) CDC Category B	Food supply Aerosol	Standard	Rare	10-40 days	Weeks	<ul style="list-style-type: none"> <li>• high fevers (up to 104-105°F)</li> <li>• severe headache</li> <li>• general malaise</li> <li>• myalgia</li> <li>• chills and/or sweats</li> <li>• non-productive cough</li> <li>• nausea</li> <li>• vomiting</li> <li>• diarrhea</li> <li>• abdominal pain</li> <li>• chest pain</li> </ul>	<b>Diagnosis:</b> The indirect immunofluorescence assay (IFA) is the most dependable serologic method. ELISA tests are also becoming more widely available. <b>Treatment:</b> <ul style="list-style-type: none"> <li>• Doxycycline is drug of choice</li> <li>• 100 mg of doxycycline taken orally twice daily for 15-21 days is a frequently prescribed therapy for adults.</li> <li>• Quinolone antibiotics have demonstrated good in vitro activity against <i>C. burnetii</i> and may be considered</li> </ul>	Low	Not commercially available
<b>E coli 0157:H7</b> ( <i>Escherichia coli</i> ) CDC Category B	Food and water	Contact	Yes oral-fecal route	1-10 days (usually 3-5 days)	5-7 days	<ul style="list-style-type: none"> <li>• severe stomach cramps,</li> <li>• diarrhea (often bloody),</li> <li>• vomiting</li> </ul>	<ul style="list-style-type: none"> <li>• Supportive care</li> <li>• Transfusions and hemodialysis may be needed</li> <li>• Role of antibiotic therapy uncertain</li> </ul>	Low	No
<b>Staphylococcal enterotoxin B</b> CDC Category B	Food and water Aerosol	Contact	No	3-12 hours after inhalation	Hours	<ul style="list-style-type: none"> <li>• Fever</li> <li>• Cough</li> <li>• Difficulty breathing</li> <li>• Headache</li> <li>• Vomiting/ nausea</li> </ul>	Supportive care	Low	No

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<b>Ricin</b> ( <i>Ricinus communis</i> ) (toxin from castor beans) <i>CDC Category B</i>	Food and water Aerosol	Standard	No	Hours to days	Death within 36-72 hours depending on route of exposure	<b>Inhaled:</b> <ul style="list-style-type: none"> <li>• respiratory distress</li> <li>• fever,</li> <li>• cough,</li> <li>• nausea,</li> <li>• tightness in the chest,</li> <li>• diaphoresis</li> <li>• pulmonary edema</li> </ul> <b>Ingested:</b> <ul style="list-style-type: none"> <li>• vomiting and diarrhea (bloody)</li> <li>• Severe dehydration</li> <li>• low blood pressure.</li> <li>• seizures,</li> <li>• hematuria</li> <li>• organ failure</li> </ul>	<ul style="list-style-type: none"> <li>• Supportive care</li> <li>• May need ventilatory support</li> </ul>	High	No
<b>Equine encephalitis</b> (Alpha viruses) <i>CDC Category B</i>	Aerosol Mosquito-borne	Standard	No	1-6 days	Days to weeks	<b>Systemic:</b> <ul style="list-style-type: none"> <li>• chills,</li> <li>• fever,</li> <li>• malaise,</li> <li>• arthralgia, and</li> <li>• myalgia</li> </ul> <b>Encephalitic:</b> <ul style="list-style-type: none"> <li>• fever,</li> <li>• headache,</li> <li>• irritability,</li> <li>• restlessness,</li> <li>• drowsiness,</li> <li>• anorexia,</li> <li>• vomiting,</li> <li>• diarrhea,</li> <li>• cyanosis,</li> <li>• convulsions, and</li> <li>• coma</li> </ul>	Supportive care	Low  ↑ morbidity in infants and children	No
<b>Influenza</b> (Pandemic) H1N1=swine H5N1=avian <i>CDC Category C</i>	Aerosol or direct contact	Droplet Novel strains may require airborne isolation	Yes	1-4 days	>2 weeks		<ul style="list-style-type: none"> <li>• Antivirals (adamantanes and neuraminidase inhibitors)</li> </ul>	Low to mod	Yes

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<b>Yellow Fever</b> <i>CDC Category C</i>	Mosquito-borne	Standard	No	3-6 days	Acute phase 3-4 days, followed by a day of remission prior to entering Toxic phase: depends on severity of symptoms	<b>Acute phase:</b> <ul style="list-style-type: none"> <li>• sudden onset of fever,</li> <li>• chills,</li> <li>• severe headache,</li> <li>• back pain,</li> <li>• general body aches,</li> <li>• nausea,</li> <li>• vomiting,</li> <li>• fatigue, and</li> <li>• weakness</li> </ul> <b>Toxic phase:</b> <ul style="list-style-type: none"> <li>• high fever,</li> <li>• jaundice,</li> <li>• bleeding,</li> <li>• shock and</li> <li>• failure of multiple organs.</li> </ul>	<ul style="list-style-type: none"> <li>• Supportive care</li> </ul>	Low to mod	Yes